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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,802	11/25/2003	Qi Cheng	SVL920030080US1	6257

47069 7590 12/14/2006

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EXAMINER

ALI, MOHAMMAD

ART UNIT PAPER NUMBER

2166

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/721,802

Applicant(s)

CHENG ET AL.

Examiner

Mohammad Ali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This communication is in response to the amendment filed on 9/29/06.

The application has been examined and claims 1-21 are pending in this office action.

Response to Arguments

2. After further search and a thorough examination of the present application claims 1-21 remain rejected:

Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al. ('Larson' hereinafter), USP, 6,850,933 in view of Admitted Prior Art (Background of the present invention) ('APA' hereinafter).

With respect to claim 1,

Larson teaches a method for executing a query (see col. 6, line 48-49, Fig. 2), comprising:

matching a query to an outlier materialized query table that stores exception data (see col. 16, lines 55-61, Larson);

searching the query for a source predicate (to determine whether a view contains all the desired rows, it must be shown that the view result is a superset of the query result. This holds if the selection predicate of the query subsumes (implies) the selection predicate of the view, which guarantees that every row satisfying the query predicate also satisfies the view predicate. There are several options for testing predicate subsumption. The preferred implementation explained herein divides the subsumption test into three tests: an equijoin subsumption test, a range subsumption, test and a residual subsumption test, see col. 6, lines 50-59, col. 16, lines 4-8, Larson);

searching an outlier predicate in the outlier materialized query table that corresponds to the source predicate for a target column that corresponds to a source column in the source predicate (it is determined whether the view output contains exactly the same expression (taking into account column equivalences). If so, the

output expression is replaced by a reference to the matching view output column at step 513. If not, it is determined whether the expression's source columns can all be mapped to view output columns, i.e., whether the complete expression can be computed from (simple) output columns, at step 515. If they can all be mapped, the column references of the expression are replaced by references to the matching output columns of the view, at step 517, see col. 10, lines 64 to col. 11, lines 4, col. 16, lines 62-67, Larson);

deriving a new range predicate based on the target column (see col. 16, lines 29-35, Larson); and

introducing the new range predicate into the query, wherein the query is executed to retrieve data from one or more data stores (the compensating range predicates are determined that are to be applied to the view to produce the query result. If a query range matches the corresponding view range, no further restriction is needed. If the lower bound does not match, the view result is restricted by enforcing the predicate $(T.C \geq lb)$ where T.C is a column in the (query) equivalence class and lb is the lower bound of the query range. If the upper bounds differ, the predicate $(T.C \leq ub)$ is enforced, where ub is the upper bound of the query range, see col. 7, lines 66 to col. 8, lines 1-8, Larson).

Larson does not explicitly indicate claimed "materialized query table that stores exception data".

APA teaches materialized query table that stores exception data (the notion to use pre-computed materialized query tables that store exception data is introduced. The

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materialized query tables that store exception data may also be referred to as "outlier tables" or "outlier MQTs." Using this materialized query table, newly introduced predicates ("new predicates" or "new range predicates") are generated to help with the access plan of the underlying table, while the exception or outlier data is picked up from the materialized query table and added to the result, see APA, para 0010).

It would have been obvious to one ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because materialized query table that stores exception data of APA's teaching would have allowed Larson's system to optimize the queries in the database system.

As to claim 2,

Larson teaches merging the new range predicate into the query (see col. 9, lines 59-61, Larson).

As to claim 3,

Larson teaches generating a bounds view from source predicate information and range binding information collected for the target column, wherein the bounds view computes a lower bound and an upper bound for the new range predicate, and wherein the bounds view may be generated using at least one of a range multiplying technique or a range stretching technique (see col. 9, lines 16-26, Larson).

As to claim 4,

Larson teaches wherein matching the query to an outlier materialized query table further comprises: creating a first query graph model representation of the query (see col. 5, lines 55-65, Larson);

creating a second query graph model representation of the outlier materialized query table (see col. 11, lines 54-59, Larson); and

comparing the first query graph model and the second query graph model (see col. 7, lines 39-51 et seq., Larson).

As to claim 5,

Larson teaches wherein there is a join in the outlier materialized query table and wherein matching further comprises: determining that join predicates other than the outlier predicate in the outlier materialized query table have matching predicates in the query (see col. 7, lines 39-51, Larson).

As to claim 6,

Larson teaches wherein the new range predicate is derived by selecting the target column from base tables involved in the join (see col. 16, lines 62-67, Larson).

As to claim 7,

Larson teaches wherein the target column is from a table other than the one in which the source column resides (see col. 14, lines 13-21, Larson).

As to claim 8,

Larson teaches wherein the target column is from a same table as the one in which the source column resides (see col. 14, lines 13-21, Larson).

As to claim 9,

Larson teaches wherein the query contains a correlation predicate (see col. 16, lines 5-13, Larson).

As to claim 10,

Larson teaches translating the correlation predicate into a join predicate in a context of the outlier materialized query table (see col. 16, lines 55-67, Larson);

when the translated join predicate matches the join predicate in the outlier materialized query table, deriving a new predicate for the correlation predicate in a child query block using a source predicate on a quantifier of a parent query block (see col. 8, lines 40-67, Fig. 3, Larson); and

wherein searching the query for the source predicate further includes searching the parent query block for the source predicate (see col. 8, lines 40-67, Fig. 7, Larson).

Claims 11-21 have same subject matter as of claims 1-10 and essentially rejected for the same reasons as discussed above.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Ali whose telephone number is (571) 272-4105. The examiner can normally be reached on Monday-Thursday (7:30 am-6:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain T. Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Mohammad Ali
Primary Examiner
Art Unit 2166

MA
December 9, 2006